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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,311	10/15/2003	Sandor Nagy	88-2058A	7251
24114	7590	02/09/2005	EXAMINER	
LYONDELL CHEMICAL COMPANY 3801 WEST CHESTER PIKE NEWTOWN SQUARE, PA 19073			LEE, RIP A	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/686,311

Applicant(s)

NAGY ET AL.

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01-21-2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is insufficient antecedent basis for the limitation, "the support material" in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 and 5-17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,232,260 to Nagy *et al.*

The prior art of Nagy *et al.* relates to a catalyst and a process for polymerization of olefin in the presence of the catalyst. The inventive catalyst is comprised of an activator and a group 3-10 organometallic complex containing at least one indenoindolyl ligand bonded to the metal (claim 1). As shown in claim 7, the indenoindolyl ligand has the general structure in which any

Art Unit: 1713

of the ring atoms is substituted with one or more substituents such as nitro (NO₂), dialkylamino (NR₂), diarylamino (NAr₂), alkoxy (RO), aryloxy (ArO), or thioether (RS) groups. Notably, the structure shows the indole nitrogen bearing the variable substituent, R. Thus, it is clear that indenoindolyl ligands in which the indole nitrogen contains the recited heteroatom containing substituents is also taught by the claims of the prior art. The reference shows examples of non-bridged organometallic complexes (col. 4, lines 1-11; see also structure in example A; example B). Processes for polymerization of olefin in the presence of inventive catalysts are illustrated in examples 1-9. Therefore, the subject matter of present claim 1 is disclosed entirely in Nagy *et al.*

The remaining claims of the instant application describe meaningful developments of the present invention. The subject matter of present claims 2, 3, 5, and 6 is disclosed in Nagy *et al.* as follows: Representative metal complexes contain a group 4 metal center (claim 3). The activator is an aluminoxane, an alkylaluminum, an organoborane, an ionic borate, or ionic aluminate (claim 2). The olefin includes ethylene and C₃-C₂₀ α-olefins such as propylene, 1-butene, 1-hexene, and 1-octene. Ethylene and mixtures of ethylene with C₃-C₁₀ α-olefins may be polymerized (col. 6, lines 17-21). The scope of present claims 7-9 are taught in claim 7 of Nagy *et al.* (*vide supra*). Both alkoxy and aryloxy groups are ether groups, and the aryloxy group, by definition, contains an aromatic ring bearing an ether group. The dialkylamino and diarylamino groups are tertiary amines. The features of instant claims 10-13, which relate to manipulative aspects of the polymerization process are disclosed in the prior art. According to the inventors, the catalyst may be supported on silica (col. 4, line 49). Olefin polymerization reactions can be carried out at a temperature range of 30-180 °C. Moreover, the processes are amenable to slurry phase and gas phase polymerization techniques (col. 6, lines 23-29). Regarding present claims

14 and 15, Nagy *et al.* discloses both indeno[3,2-*b*]indole and indeo[2,3-*b*]indole isomers (see figures in col. 2), and specific organometallic compounds contain the indeno[3,2-*b*]indole isomer (col. 4, lines 1-11; examples A and B; claim 7). In example A, the second π -bound ligand is another indenolindolyl ligand, but complexes in which the π -bound ligand is cyclopentadienyl, indenyl, or fluorenyl is also taught in claim 4 of Nagy *et al.* Thus, the subject matter of present claim 16 is disclosed in the patent. Finally, compounds containing the aryloxygroup (*supra*) meets the structural features recited in present claim 17. In summary, claims 1-3 and 5-17 are anticipated by Nagy *et al.*

5. Claims 1-17 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 6,583,242 to Wang *et al.*

The prior art of Wang *et al.* relates to a supported olefin polymerization catalyst system and polymerization of olefin in the presence of the supported catalyst. The catalyst contains an activator, silica support, and a group 3-10 organometallic complex with at least one indenolindolyl ligand bound to the metal center (see claim 1). As indicated in column 2, lines 25-38 of the patent, these organometallic complexes are taught in U.S. Patent No. 6,232,260 (Nagy *et al.*), and the teachings therein are incorporated by reference. As further support, the patent states:

“...any of the indenolindolyl ring atoms can be unsubstituted or substituted with one or more groups such as... nitro, dialkylamino, diarylamino, alkoxy, aryloxy, or thioether, or the like.”

Art Unit: 1713

The relevance of the teachings of Nagy *et al.* to present claims 1-3 and 5-17 have been discussed in the previous paragraph and need not be repeated here. Regarding present claim 4, the current patent, Wang *et al.*, teaches a process in which a portion of the activator is used to treat the silica support. Another portion of activator is combined with the organometallic complex, and the reaction product thereof is loaded onto the support (see procedure of catalyst 1A). In summary, present claims 1-17 are anticipated by Wang *et al.*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



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February 1, 2005